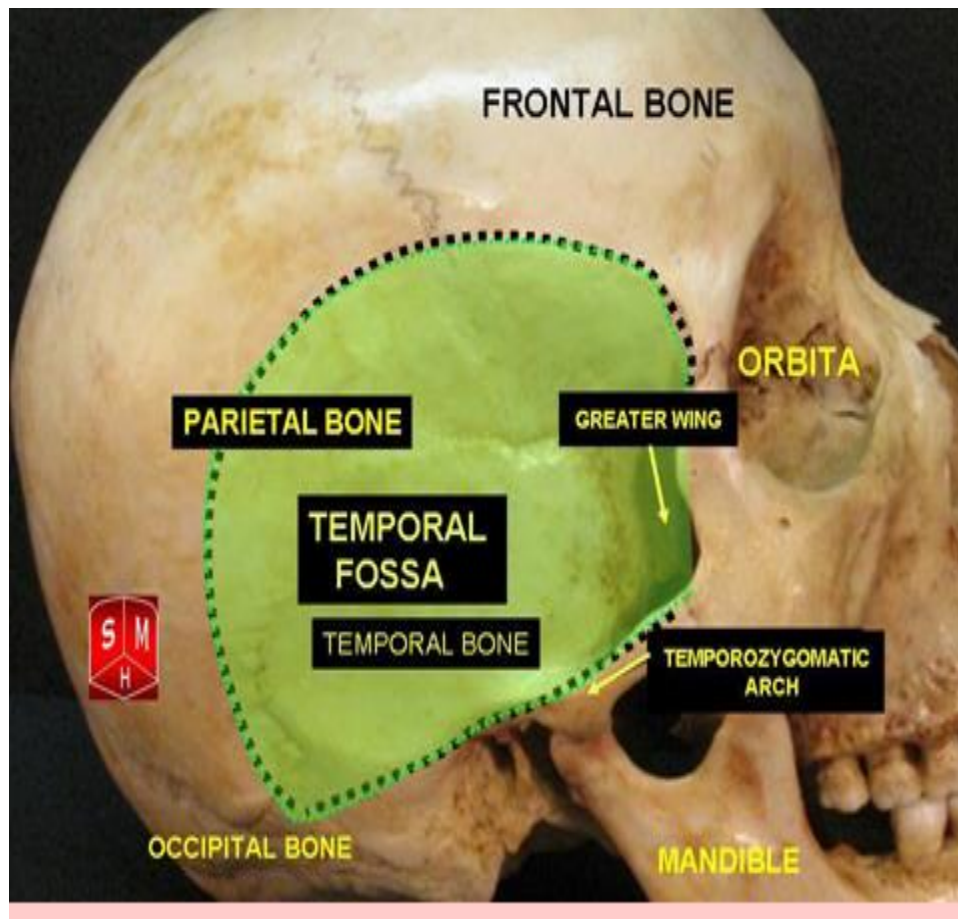


At the end of the lecture you should be able to:

1. Define the temporal fossa and Identify the boundaries
2. Enlist the contents of temporal fossa
3. Describe the course of superficial artery, deep temporal nerve, auriculotemporal nerve and zygomaticotemporal nerve
4. Define infratemporal fossa and Identify its boundaries
5. Enlist the contents of infratemporal fossa
6. Describe the course of mandibular nerve , and its branches in the infratemporal fossa
7. Identify the otic ganglia and chordatympani nerve and the area supplied by their
8. Identify the maxillary artery and its branches
9. Clarify the importance of pterygoid venous plexus

Temporal fossa

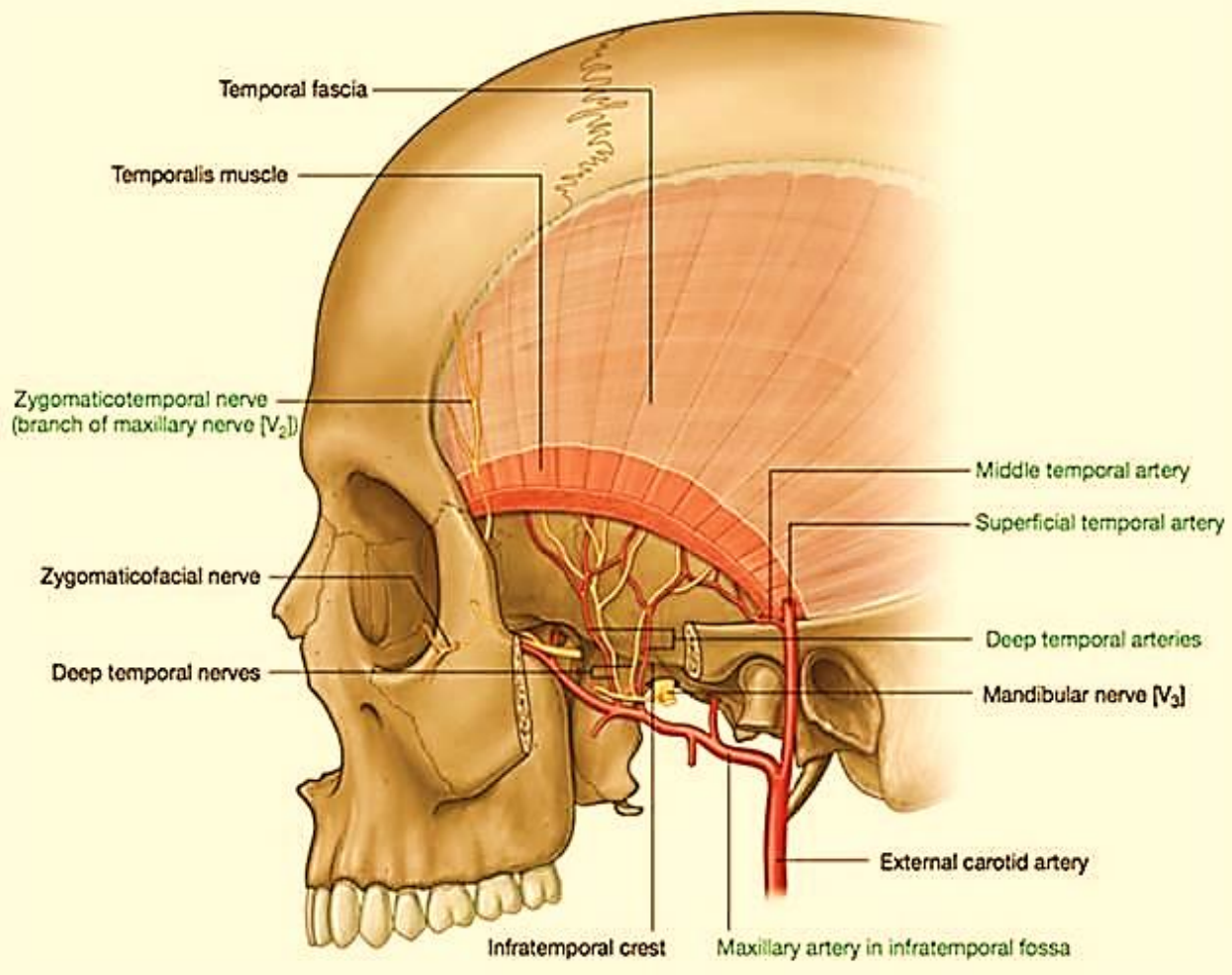
The temporal fossa is a depression on the temporal region and one of the largest landmarks on the skull. The temporal bone, the sphenoid bone, the parietal bone and the frontal bone contribute to its concave wall. It is superior to the infratemporal fossa which lies beneath the zygomatic arch.



The Boundaries Are

- * Superiorly and posteriorly : is bordered by the superior temporal line (origin of the deep temporal fascia).
- * Inferiorly : runs along the zygomatic arch.
- * Anteriorly : anterior border is marked by the frontal process of the zygoma and the zygomatic process of the frontal bone.

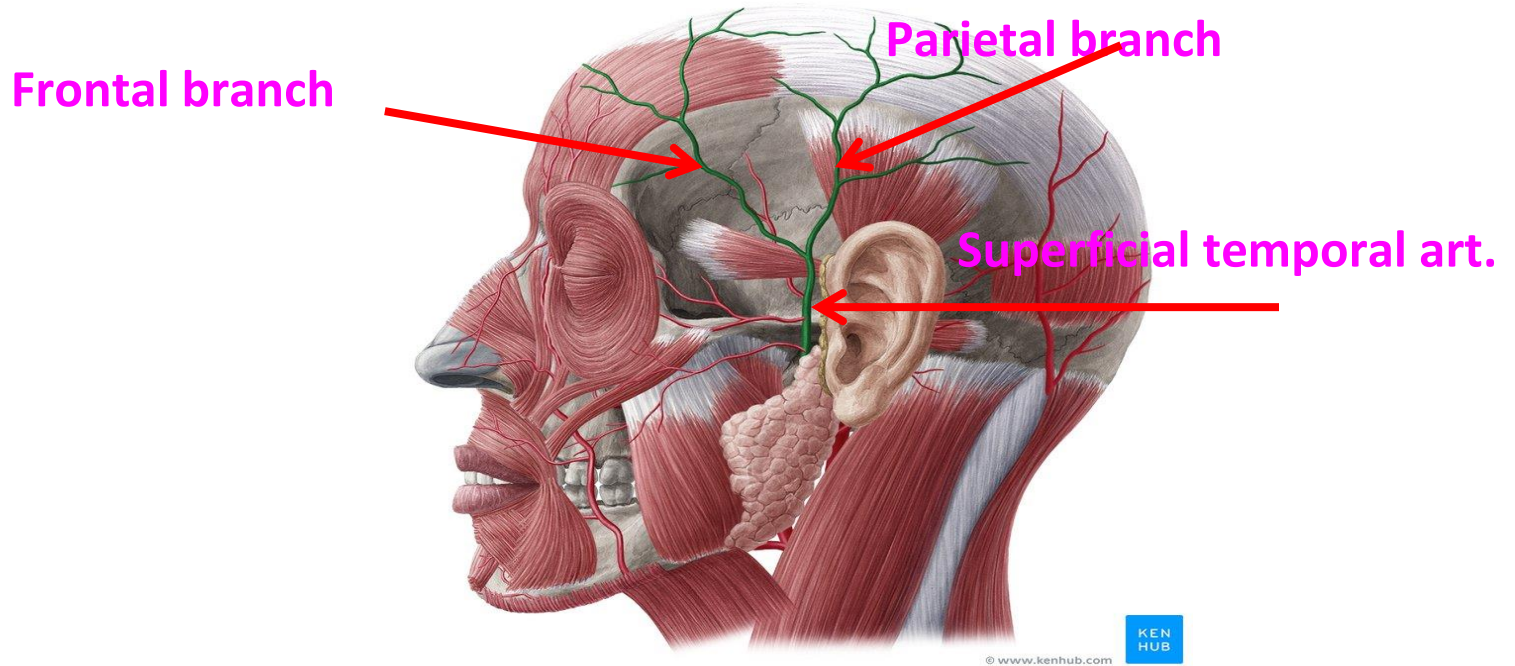
The Contents Are:



1. Temporalis muscle And Fascia covers temporalis

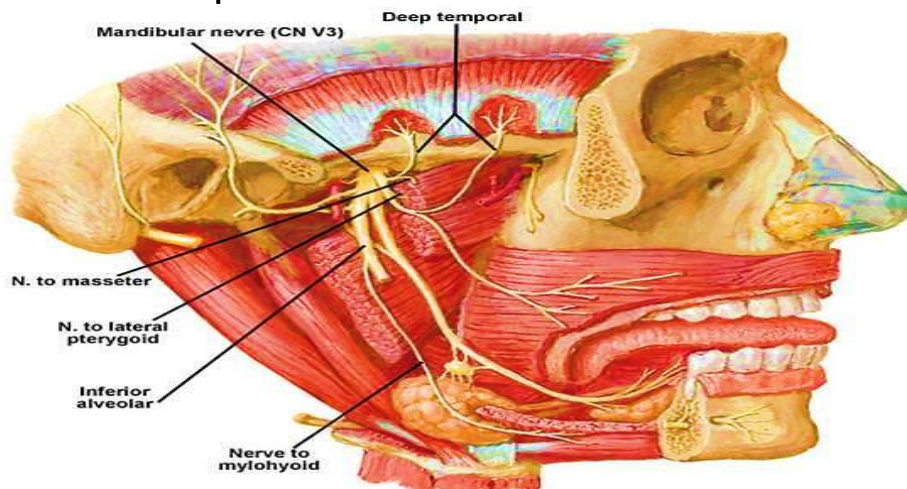
2. The superficial temporal artery:

- * The smaller of two end branches that split superiorly from the external carotid.
- * Appears to be a continuation of the external carotid.
- * Begins within the parotid gland, behind the neck of the mandible
- * Passes superficially over the posterior root of the zygomatic process of the temporal bone
- * Divides into two branches frontal and parietal arteries.
- * Its pulse can be felt above the zygomatic arch, above and in front of the tragus of the ear.



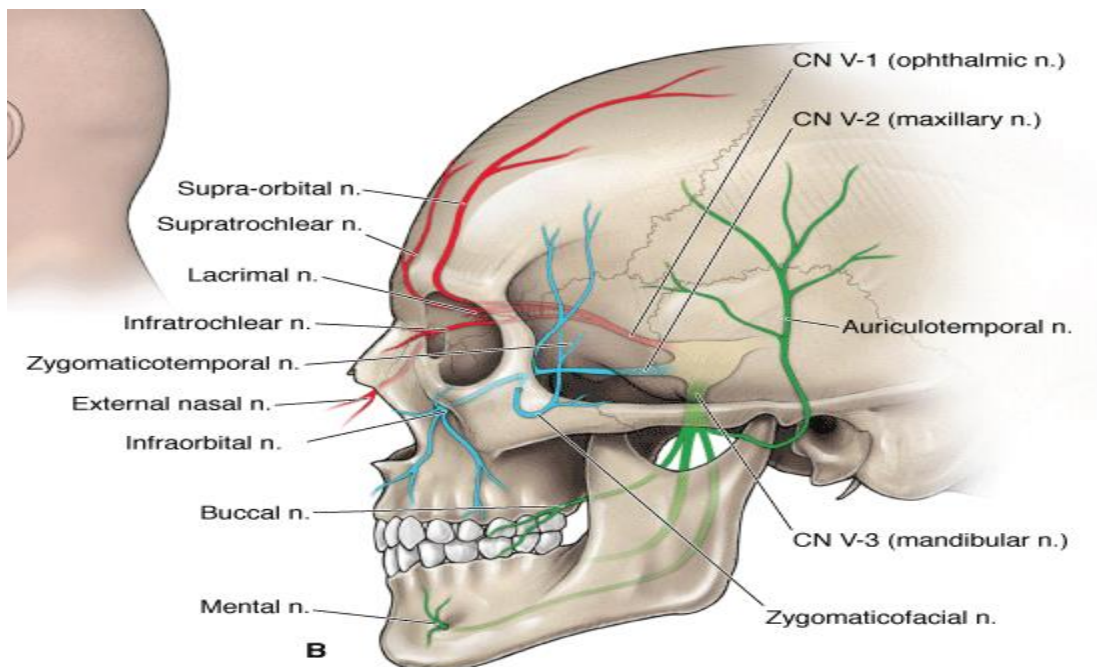
3. Deep temporal Nerve

- * Is branches of the mandibular division of the trigeminal nerve,
- * Two in number, anterior and posterior
- * Pass above the upper border of the lateral pterygoideus muscles
- * Enters the deep surface of the temporalis muscles.



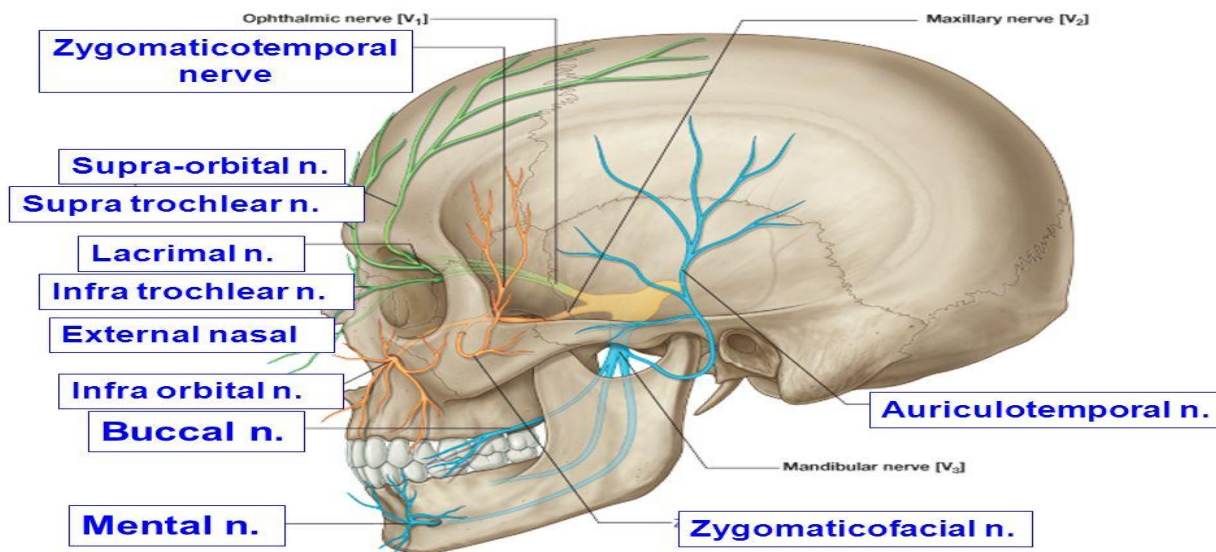
4. Zygomatico temporal nerve:

- * Derived from the zygomatic nerve, a branch of the maxillary nerve.
- * Runs along the lateral wall of the orbit in a groove in the zygomatic bone,
- * Receives a branch of communication from the lacrimal nerve
- * Passes through the zygomaticotemporal foramen in the zygomatic bone
- * Enter the temporal fossa.
- * Supply to the skin of the side of the forehead.



5. Auriculotemporal nerve:

- * Arises by 2 roots encircling middle meningeal artery
- * Runs backward, deep to neck of mandible
- * Gives sensory branches to skin of auricle, temple, TMJ & parotid gland
- * Carries postganglionic parasympathetic secretomotor fibers from otic ganglion to parotid gland.

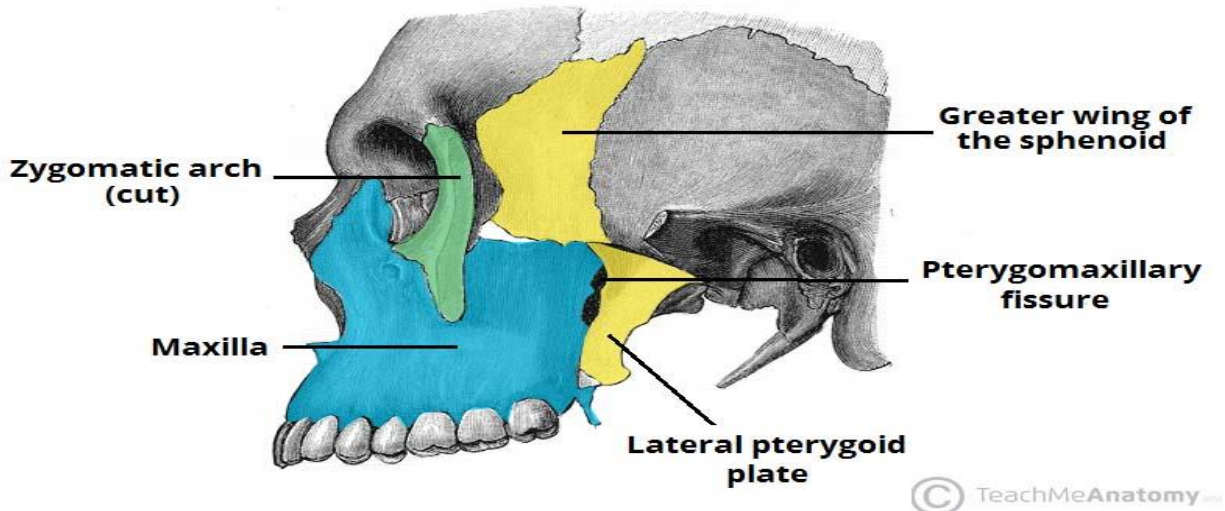


Applied Anatomy :

The pterion is an important structure in temporal fossa. It is the point where the temporal, parietal, frontal and sphenoid bones meet and the skull is at its weakest. Trauma in this region can lead to an extradural haematoma as the middle meningeal artery (MMA) lies deep to it.

Infratemporal fossa

The infratemporal fossa is a complex area located at the base of the skull, deep to the masseter muscle. It is closely associated with both the temporal and pterygopalatine fossae and acts as a conduit for neurovascular structures entering and leaving the cranial cavity.



Boundaries :

It is a wedge shape, located deep to the masseter muscle and zygomatic arch. The fossa is closely associated with both the pterygopalatine fossa, via the pterygomaxillary fissure, and also communicates with the temporal fossa, which lies superiorly

- Laterally – condylar process and ramus of the mandible bone
- Medially – lateral pterygoid plate
- Anteriorly – posterior border of the maxillary sinus
- Posteriorly – styloid process carotid sheath
- Roof – greater wing of the sphenoid bone
- Floor – Medial pterygoid muscle

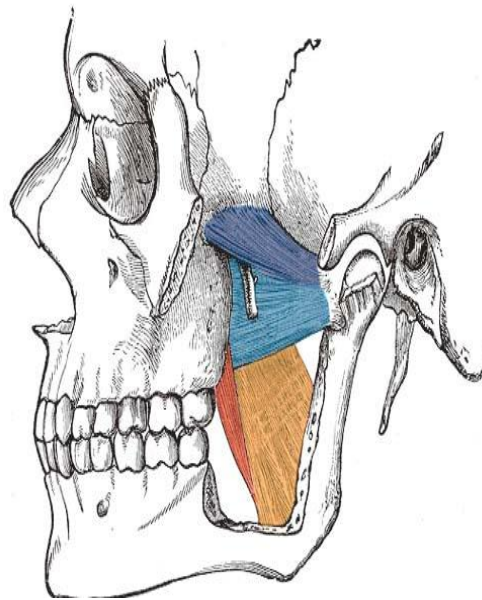
The roof of the infratemporal fossa, formed by the greater wing of the sphenoid bone, provides an important passage for the neurovascular structures transmitted through the foramen ovale and spinosum. Among these are the mandibular branch of the trigeminal nerve and the middle meningeal artery.

The Contents :

The infratemporal fossa acts as a pathway for neurovascular structures passing to and from the cranial cavity, pterygopalatine fossa and temporal fossa.

1. Muscles

The infratemporal fossa is associated with the muscles of mastication. The medial and lateral pterygoids are located within the fossa itself, whilst the masseter and temporalis muscles insert and originate into the borders of the fossa.



- Superior head of the lateral pterygoid
- Inferior head of the lateral pterygoid
- Deep head of the medial pterygoid
- Superficial head of the medial pterygoid

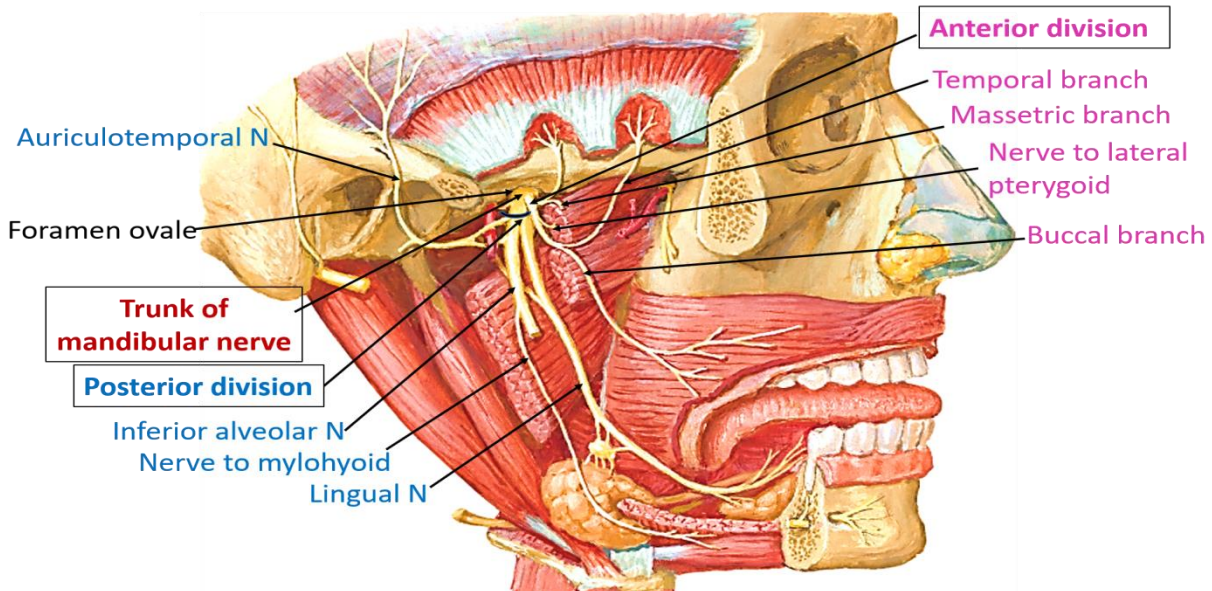
2. Nerves

The infratemporal fossa forms an important passage for a number of nerves originating in the cranial cavity

Mandibular nerve and its branches

Mandibular nerve is a branch of the trigeminal nerve

- ✓ Formed of 2 roots: motor & sensory
- ✓ Both roots emerge separately through foramen ovale to infratemporal fossa
- ✓ The 2 roots unite, below foramen ovale
- ✓ Then divides into two divisions
- ✓ a small anterior
- ✓ a large posterior



Branches of main trunk are two :

- ✓ Motor: Nerve to medial pterygoid and gives off 2 branches that pass through otic ganglion & supply tensor palati & tensor tympani muscles
- ✓ Sensory: meningeal branch (nervus spinosus) passing through foramen spinosum to supply meninges of middle cranial fossa

Branches of Anterior division are four:

Three motor:

- ✓ Masseteric nerve: emerges through upper border of lateral pterygoid & turns along mandibular notch to reach masseter
- ✓ Deep temporal nerves: emerge through upper border of lateral pterygoid
- ✓ Nerve to lateral pterygoid

One sensory:

- ✓ Buccal nerve: emerges between the 2 heads of lateral pterygoid, supplies skin & mucous membrane overlying buccinator

Branches of posterior division are four:

Three sensory:

1. Auriculotemporal nerve (Sensory):

2. Lingual nerve(Sensory)::

- Emerges through lower border of lateral pterygoid then superficial to medial pterygoid
- Joins chorda tympani
- Runs just below 3rd molar tooth (dangerous position because it is only covered by mucous membrane)
- Runs superficial to hyoglossus & is connected to submandibular ganglion by 2 roots
- Carries general sensations from anterior 2/3 of
- Damage of this nerve cause

3. Inferior alveolar nerv(Sensory): e:

- Emerges through lower border of lateral pterygoid then superficial to medial pterygoid, behind lingual nerve
- Passes through mandibular foramen & canal to supply lower teeth
- Emerges through mental foramen as mental nerve supplying skin of lower lip & chin

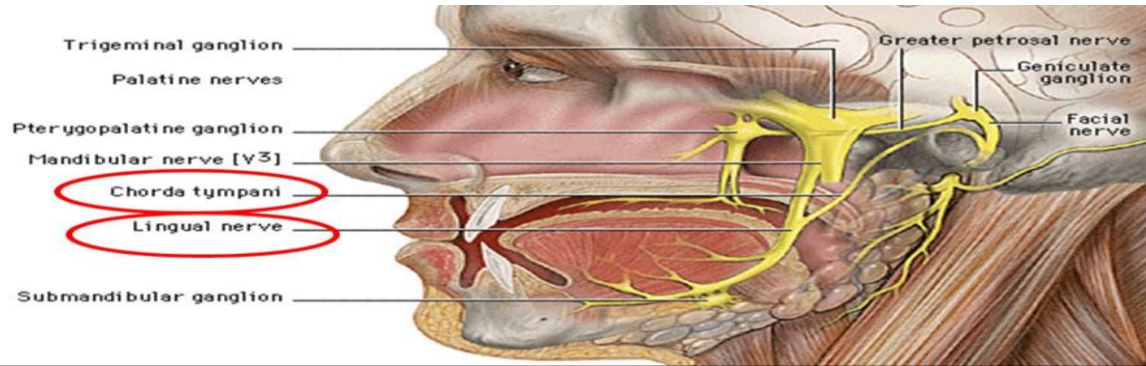
One Motor

Nerve to mylohyoid

- A branch of inferior alveolar nerve just above mandibular foramen
- Passes in mylohyoid groove of mandible
- Supplies mylohyoid & anterior belly of digastric muscles

Chorda tympani

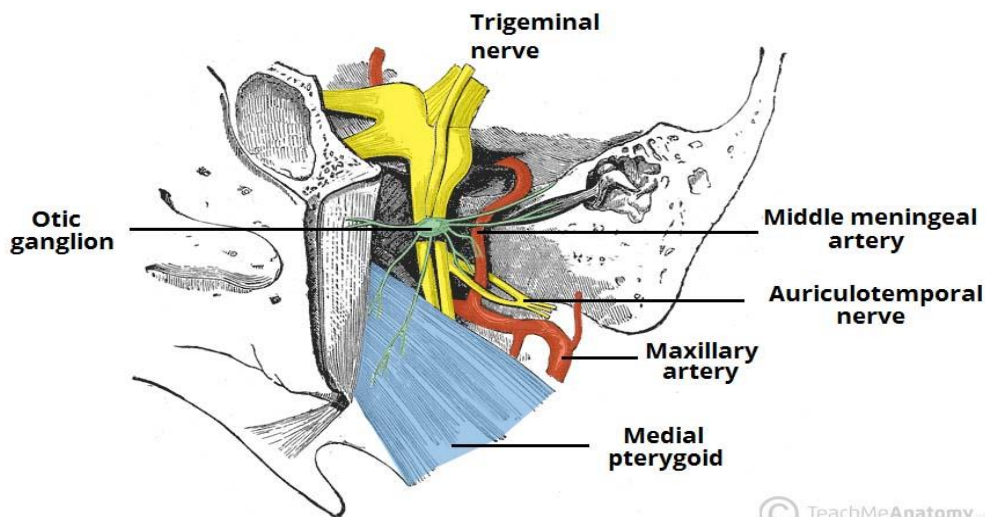
- ✚ A branch of CN VII carrying taste fibers from the anterior two thirds of the tongue.
- ✚ It follows the anatomical course of the lingual nerve
- ✚ Also carries secretomotor fibers for the submandibular & sublingual salivary glands.



Otic ganglion

Located in the infratemporal fossa, just inferior to the foramen ovale. Presynaptic parasympathetic fibers, derived mainly from the glossopharyngeal nerve (via the lesser petrosal nerve), synapse in the otic ganglion.

Postsynaptic parasympathetic fibers, secretory to the parotid gland, pass from the otic ganglion to this gland through the auriculotemporal nerve.



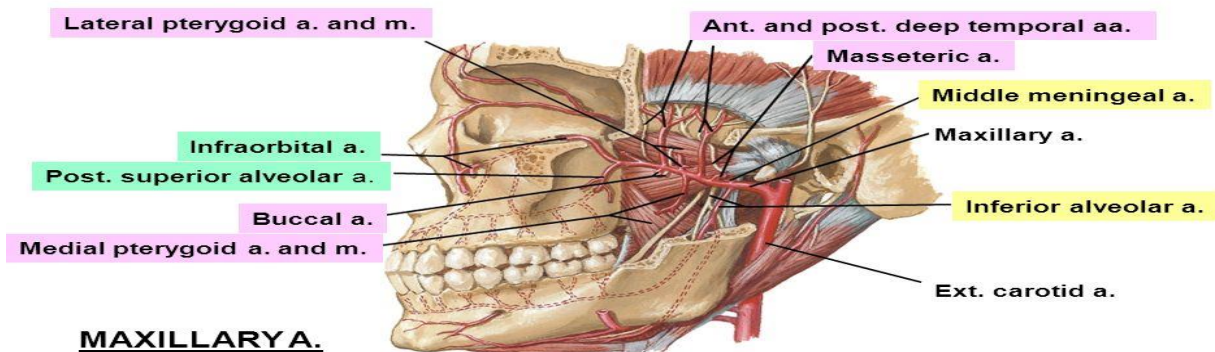
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4. Blood vessels :

➤ Maxillary artery:

- The vascular supply of the infratemporal fossa comes singularly from the maxillary artery. The branches have been divided into three parts
- Mandibular part
- Pterygoid part
- Pterygopalatine part

MAXILLARY ARTERY



MAXILLARY A.

BRANCHES OF 1ST (MANDIBULAR) PART

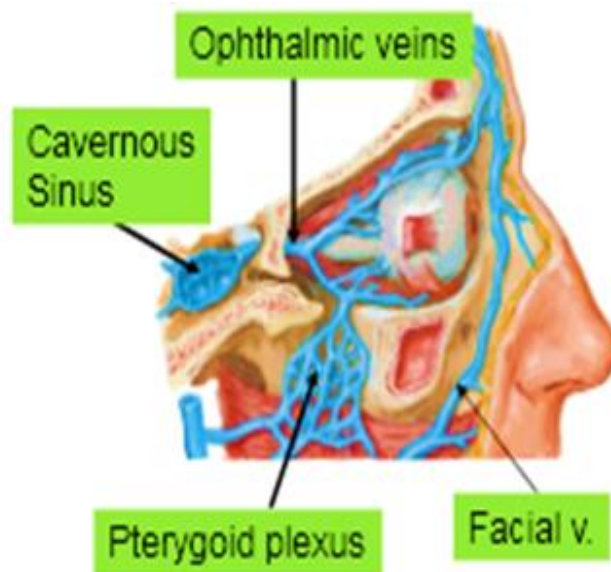
BRANCHES OF 2ND (PTERYGOID) PART

BRANCHES OF 3RD (PTERYGOPALATINE) PART

f. Netter M.D.

➤ Pterygoid venous plexus

The pterygoid venous plexus is directly connected to the cavernous sinus and drains the eye. Infections of the skin and eye socket are able to track back into this plexus within the fossa and up into the cavernous sinus, making meningitis a substantial risk. Other veins in the fossa include the maxillary vein and middle meningeal vein.



Answer the following questions :

1. What is the clinical importance of temporal fossa

2. Where is the anatomical site of feeling the pulse of superficial temporal artery

3. Damage of lingual nerve before it is joined by chorda tympani in infratemporal fossa would cause loss of :

- a. general sensation to anterior $2/3^{\text{rd}}$ of tongue
- b. general sensation to anterior $1/3^{\text{rd}}$ of tongue
- c. taste sensation from the anterior $2/3^{\text{rd}}$ of tongue
- d. taste sensation from posterior third of tongue